

CLAIMS

1. A photo-detecting device comprising:

N photodiodes (N: two or more integer) each generating an electric charge in response to an intensity of incident
5 light;

a first substrate in which said N photodiodes are provided, said N first bonding pads corresponding to said N photodiodes respectively are arranged on one surface of said first substrate;

10 a second substrate bump-connected with said first substrate, said second substrate having a first surface which faces said first substrate and on which N second bonding pads corresponding to said N first bonding pads are provided while each electrically connected to the associated first bonding pad among said N first bonding pads through a bump, said second substrate including a device formation layer between said first surface and a second surface opposing said first surface;

20 N switches provided in said device formation layer of said second substrate corresponding to said N photodiodes respectively and each having electrically switchable first and second terminals, each of said first terminals being electrically connected to the associated photodiode among said N photodiodes through the associated first bonding pad, bump, and second bonding pad;

25 a common wire provided in said device formation layer

of said second substrate, said common wire being commonly connected to each of said second terminals of said N switches; and

an integrating circuit provided in said device
5 formation layer of said second substrate, for storing the inputted electron charge through said common wire, said integrating circuit having an input terminal electrically connected to said common wire and an output terminal for outputting a voltage corresponding to the stored electric
10 charge.

2. A photo-detecting device according to claim 1, wherein said N switches, said common wire, and said integrating circuit are arranged in a region within said device formation layer of said second substrate, said region corresponding to a region, in which said N second bonding pads are arranged, within said first surface of said second substrate.

3. A photo-detecting device according to claim 1, wherein the input terminal of said integrating circuit is connected to said common wire at a position where a maximum distance of electric charge movement paths respectively reaching from said N photodiodes to the input terminal of said integrating circuit becomes minimum.

4. A photo-detecting device according to claim 1, 25 wherein a layout pitch of said bumps disposed between said first substrate and said second substrate is shorter than

that of said N photodiodes in said first substrate.

5. A photo-detecting device according to claim 1,
wherein a resin is filled between said first and second
substrates.

5 6. A photo-detecting device comprising M
photo-detecting units (M: two or more integer) each having
the same structure as a photo-detecting device according
to claim 1.

7. A photo-detecting device comprising M
10 photo-detecting units (M: two or more integer) each having
the same structure as a photo-detecting device according
to claim 1;

15 a first common substrate corresponding to each of said
first substrates of said M photo-detecting units; and
a second common substrate corresponding to each of said
second substrates of said M photo-detecting units.